

**CONSTRUCTION OF LAMPSHADES**Field of the invention

5       The present invention relates to a hollow body. Though  
the hollow body could be used for various purposes, for  
example as a tea cosy or even as a tent, it will hereinafter  
be referred to for convenience as a lampshade, as this is  
the primary application for the invention.

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Background of the invention

Conventionally, lampshades of good quality are  
manufactured by stretching a fabric, such as silk, over a  
15 wire frame so that the fabric totally conceals the wire  
frame. This method of manufacture is labour intensive and  
therefore costly to implement.

Several less costly alternative methods of producing  
20 lampshades have previously been proposed but none has  
resulted in a lampshade that compares in quality with, and  
is as aesthetically appealing as, a fabric stretched over a  
wire frame.

25       WO 02/18838 (Sviland) describes a kit for making a  
frustoconical lampshade where the panels are secured  
together by rivet-like fasteners through pre-cut registered  
holes in the panels. Here the fasteners mar the appearance  
of the lampshade.

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GB 633,155 (Page) describes lampshade, that can only be  
cylindrical or conical made of stiff panels wherein the  
panels, with their edges abutting and exposed, are secured  
to slots in a transversely located ring and retained in  
35 place with string or tape.

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GB 653,645 (Heppel) describes a lampshade, similar in appearance to that of Page, which is made from panels that have slots or holes at each corner of the panel, secured to two specially designed transverse members through the slots, or holes.

GB 1,372,263 (Collins) discloses a further conical or cylindrical shade made from panels where the panels have one slot in each corner by which each panel is clipped to rigid rings that hold them in place with edges abutting.

Page, Heppel and Collins all have limited design possibilities as they can only produce shades which are cylindrical or conical with panels that bow outwards. None can be used to produce a shade resembling a fabric stretched over a wire frame.

GB 322,266 (Gibson) and GB 624,635 (Morris) describe lampshades made from a plurality of panels where the panels have holes along their edges and are laced together with string or similar lacing material through the holes in adjacent panels. In both cases, the appearance of the shade is marred by the clearly visible stitching.

GB 700,348 (Waite), which is believed to represent the closest prior art to the present invention, describes stiff panels that are joined to one another edge to edge. The join between adjacent panels is made by adhering a braid which is also used as decoration along the lower and upper edges of the lampshade. Aside from the cost of the braid, it once again mars the appearance of the lampshade.

#### Object of the invention

The present invention therefore seeks to provide a versatile lampshade construction that can be used to produce a wide variety of shapes and enables lampshades as

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aesthetically appealing as those made of a fabric stretched over a wire frame to be manufactured less expensively.

Summary of the invention

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According to the present invention, there is provided a lampshade comprising a plurality of panels joined to one another edge to edge, wherein each panel is formed of a laminate comprising a relatively stiff substrate material and an overlying relatively flexible decorative layer and  
10 wherein, at each join between adjacent panels, the flexible layer of at least one of the panels extends beyond the edge of the substrate to form a loose flap that serves to conceal the edge of the substrate material.

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The substrate should be formed of a material that is capable of being bent to the desired outline of the lampshade but having sufficient rigidity to ensure that the assembled lampshade does not collapse under its own weight.

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Conveniently, the substrate may be card, parchment or a plastics material. A preferred plastics material is PET because it has a high working temperature, good tensile strength and good tolerance to ultraviolet rays. A  
25 particular type of PET is that sold under the trademark MYLAR and manufactured by DuPont.

The decorative material is typically made of a woven fabric, preferably silk, but it may be made of a non-woven  
30 material.

It is possible to use the loose flaps exclusively for the purpose of covering the edges of the substrate material at the joins and to rely on some other means to join  
35 adjacent panels to one another. For example, the panels may be joined to one another by an adhesive tape applied to the inner sides of the panels. Alternatively, the side edges may

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be shaped to interlock mechanically with one another such as by forming interlocking dovetail portions along the mating edges. If positioned on the outside of the lampshade, the dovetail portions can provide an attractive stickleback effect.

It is however preferred for the loose flaps to serve as part of the means that act to secure adjacent panels to one another.

In one embodiment of the invention, adjacent panel edges are butt jointed to one another. This may be achieved by arranging for each panel to have a loose flap that is folded over the edge of the substrate of the same panel, the two loose flaps being secured to one another, such as by sewing.

In an alternative embodiment of the invention, one of the edges at each join may overlap and overlies the other. This may be achieved by providing the edge of only the upper of the two adjacent panels with a loose flap, which is folded twice to cover the edges of the substrates of both panels, and which is secured to the lower panel.

Within the same lampshade, it is possible to use both butt joins and overlapping joins for the different joins and the direction of overlap may either be the same at every join or may alternate around the perimeter of the lampshade.

Loose flaps of the decorative material are also preferably provided along the upper and lower edges of the panels. These can be used solely for concealing the edges of the substrates but they can also be wrapped about wire loops that are used to strengthen the lampshade or as part of the frame for mounting the lampshade on a lamp or light socket.

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Brief description of the drawings

The invention will now be described further, by way of example, with reference to the accompanying drawings, in which :

Figures 1A, 1B, 1C and 2 to 7 show different parts and steps in the formation of a first type of lampshade of the present invention in which loose flaps of the flexible material are used in securing the panels to one another and

Figures 8 and 9 show a panel and a finished lampshade in which the panels are designed to interlock with one another mechanically.

Detailed description of the preferred embodiments.

Referring now to Figure 1 - 7, there is illustrated the production of a first embodiment of the invention. The embodiment is a lampshade with a substrate which may be card, parchment or a plastics material. A preferred plastics material is PET because it has a high working temperature, good tensile strength and good tolerance to ultraviolet rays. A currently preferred type of PET is that sold under the trademark MYLAR and manufactured by DuPont.

The panel 28 comprises a substrate 33, shown in Figure 1a, which may be of any desired shape. The panel 28 also comprises a fabric or other flexible material 36 with which the substrate 33 is laminated. A loose flap G, of sufficient size to allow the material 36 to be folded over the edge of the substrate 33 is provided along the side of the laminated substrate 33 to serve for securing adjacent panels to one another and to conceal the edge of the substrate at the joins. The fabric material 36 is cut along the outer edge of the loose flap G. The loose flap G is shown to be of constant width the edge of the substrate 33, but it may be desirable for aesthetic or other reasons to vary its width at points along the edge of the substrate 33. The panel 28

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is thus composed of material 36, which is laminated to the substrate 33, with a loose flap G of material 36 along one or more edges of the substrate 33 as shown in Figure 1A.

5       The lampshade shown in Figure 4 is composed of nineteen of the panels 28. Each panel 28 is attached to its adjacent panel such that the right side of one panel 28 is butt jointed to the left side of the next panel 28 as shown in Figure 2 with the loose flaps G being pulled through to the  
10 interior of the lampshade in between adjacent panels. All panels 28 are secured together, each panel being secured to the adjacent edge of the next panel 28 by stitching, stapling or gluing or taping together their loose flaps. The  
15 best result is achieved by the securing point being kept as close as possible to the unlaminated faces of the substrates 33.

      The loose flap G of the material 36 on each panel 28 may be secured to the unlaminated reverse face of the  
20 substrates 33, such that each substrate 33 is partially enclosed by the material 36 as shown in Figures 3. This prevents the weave of the material 36 from working loose. However it may be desired to secure the loose flaps from adjacent secured edges together, in pairs, to the same  
25 substrate 33 by any suitable means.

      The formed lampshade may be secured to a frame or light bulb attachment by any known method or by the provision of a loose flap to the top and/or bottom edge of the panels,  
30 whereby the said frame or light bulb attachment is enclosed by the loose flap and secured to the uncovered face of the substrate 33.

      Figures 1B and 1C show an alternative panel 28 that is  
35 composed of a substrate 33 to which is overlaid a fabric or soft material 36. As previously, a loose flap G of the fabric or soft material extends beyond the edge of the

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substrate 33 but in this case the edge of the loose flap G is provided with a narrow strip 77 of the substrate material that is secured to the fabric or soft material 36. The strip 77 is useful where assembly is by automated machines and  
5 flapping materials might present difficulty or a guide is desired for the correct alignment of panels. The strip 77 may be removed from the panel 28 once the panels are secured together.

10       Alternative configurations in the assembly of the lampshade or other hollow article, using the panel 28, are possible, depending on the desired decorative outcome.

15       In Figure 5 there is depicted an alternative manner of securing together the panels 28 so that their edges overlap instead being butt jointed.

20       Once again such that the edge of the substrate 33 is enclosed by the loose flap G, which is secured to the reverse face of the substrate 33 with adhesive or any other suitable means. The edge of the panel 28 is overlapped onto the edge of an adjacent panel X and the adjacent edge of the overlapped panel X is also enclosed by the loose flap G, which is secured to the underlying face of the overlapped  
25 panel X. A completed lampshade of this assemblage is shown in Figure 6.

30       In the lampshade of Figure 6, there are narrow panels each of which overlies the edges of the two adjacent panels but as an alternative each panel may be designed as shown in Figure 7 to overlie the next panel along one edge and thereby achieve a stepped configuration. Thus, in Figure 7 the panels 28A are provided with a loose flap G to one edge and secured to the next panel in the same manner described  
35 above. Therefore the number of edges of a panel that need to be formed with a loose flap will depend on the configuration

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desired, and the panels may be of similar or of dissimilar and unequal shapes.

Referring now to Figures 8 and 9, there is shown the  
5 production of a second lampshade or other hollow article of the present invention. In this lampshade, the individual panels, shown in Figure 8, are connected to one another at the top and bottom by any of the method described previously but along the remainder of the length of the side edges the  
10 interlock between the panels is purely mechanical. To this end, the side edges have cut-outs that define dovetail portions 56 that slot into one another to form a lampshade having the appearance shown in Figure 9. The dovetail portions 56 project to give an attractive stickleback  
15 effect.

The panel 54 shown in Figure 8 once again is formed of a laminated sheet that has a stiff substrate and a flexible decorative fabric that extends beyond the edge of the  
20 substrate 55.

The substrate is provided with integrally formed dovetail portions 56 along its edge, and a loose flap of the overlying material 57 around the edge of each dovetail  
25 portion 56, wherein the flap of material is folded over the dovetail portion 56 to conceal the substrate not only at the edges but also on the reverse side of the dovetail portion 56. The loose flap of material may be secured to the reverse side of the dovetail portion 56 with adhesive or by any  
30 suitable method.

The panels 54 are secured together by interlocking the dovetail portions 56 of the adjacent edges of the joined panels 54 such that all dovetail portions 56 appear on the  
35 outside of the lampshade as shown in Figure 9.



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It should be noted that though the sections of the substrate between the dovetails 56 have been removed in the illustrated embodiment, they may be retained if desired and when retained they will increase the tension between the joined panels 54 and thereby improve the rigidity of the assembled lampshade. Further, the interlocking portions 56 need not be in the shape of dovetails but may be of any desired shape such as for example part circular or part of an ellipse.

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It may also be desirable for the interlocking portions to appear on the inside of the lampshade, in which event, where the interlocking portions are in the shape of dovetails, the loose flap of material G would be provided not to the dovetail portions but to the sections between the dovetail portions.

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To improve the rigidity and appearance of the lampshade of all the above described embodiments, a conformal coating may be applied to the inside of the lampshade. Though it is possible to use polyester resin coatings these tend to crack. Preferred coatings are two-part polyurethane based plastics casting resins made by Atlas Polymers Ltd. of Pontypridd, UK and marketed as DR018 or an alternative resin made by Smooth-On Inc., USA and marketed under the trademark CRYSTAL CLEAR. Both coatings have excellent bonding properties, good working temperatures, they do not crack, are water clear and will withstand exposure to ultraviolet light.

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However, it is necessary to first seal all joints on the surface of the lampshade to be coated, with adhesive or any other suitable means in order to prevent the resin contacting and staining the fabric.

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It should be mentioned that the panels need not have the same shape as one another nor need they all be of the same size. Further, the panels need not extend parallel to the central axis of the lampshade but may spiral at an angle  
5 between the top and bottom edges. A still further possibility is that a join may be provided that extends parallel to the top and bottom edges, that is to say a panel extending from the top to the bottom edges of the lampshade may itself be composed of two or more sections joined end to  
10 end. In this case, the joins of adjacent panels may be offset from one another to give a brickwork-like effect.

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